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Development of the technology of macromolecular structuring of naphtha crude residues during their oxidation to produce bitumen insulation materials

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Abstract

One of effective methods to improve the properties of special bitumen is their chemical and physical modification. The chemical a proach suggests the oxidative polymerization is related to chain-radical reactions. Therefore, the modifiers which able to participate in the oxidation of crude naphtha residues, by chemical structuring of the segments of paraffinic chains followed by the formation of polycyclic naphtheno-aromatic fragments that contribute to gumming and preventing the crystalline phase of asphaltene formation are required. Analysis of physical-mechanical properties of the bituminous insulating material (BIM) obtained from oxidized tars showed the ambiguity of their assessment, i.e. the differences in the strength properties of the coatings (C) were observed at similar velocities of naphtha residue oxidation. Modification of the properties of oxidized bitumen occurs by alteration of the nucleus size and the solvate shell of a structurally complex unit (CSU), the introduction of a multi-component bifunctional modifier (MBM) that reduces the oxidation duration and improves the physical, mechanical and insulating properties of BIM. © IDOSI Publications, 2013.

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Keywords

IR-spectroscopy, Naphtha crude residues, Nuclear magnetic resonance relaxation (NMR-relaxation), Oxidative polymerization, Paraffin-asphalt associates, Physical-chemical modification, Structurally complex units